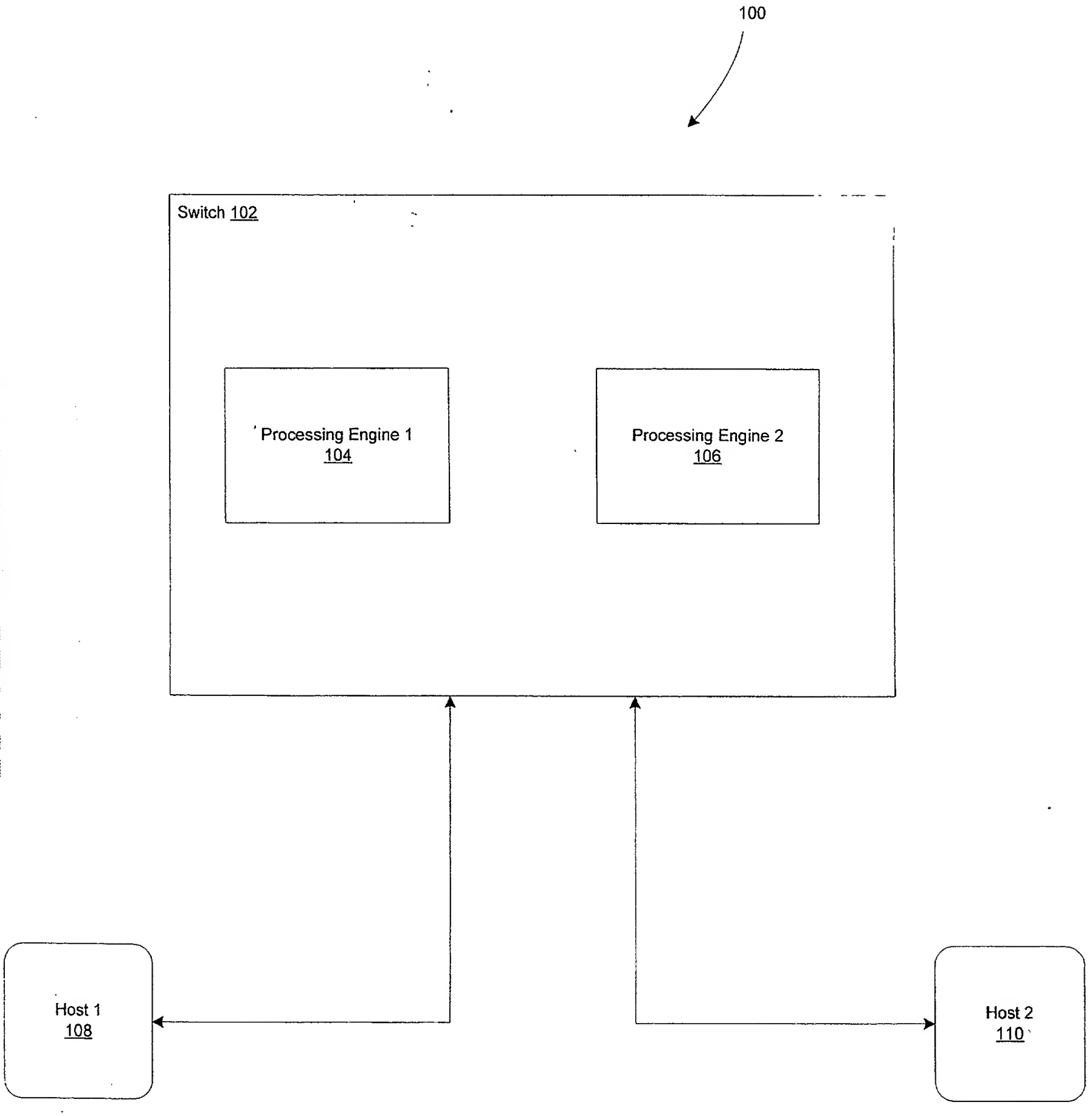

100
Switch 102
Processing Engine 1
104
Processing Engine 2
106
Host 1
108
Host 2
110

Fig. 1

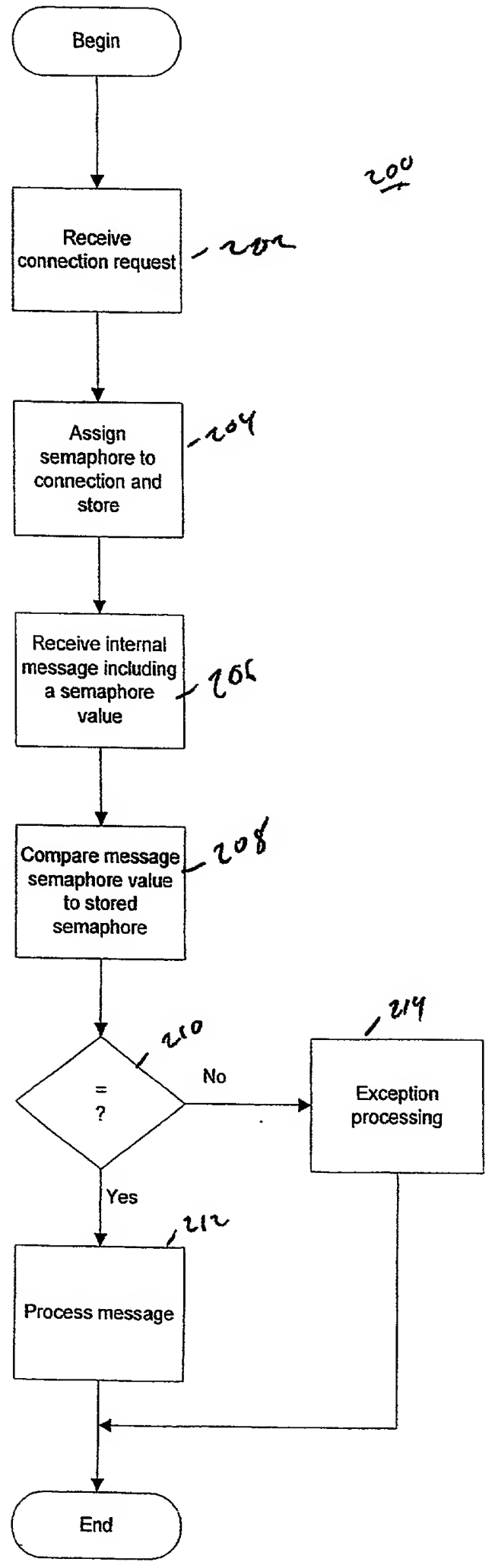

Begin
200
Receive connection request
202
Assign semaphore to connection and store
204
Receive internal message including a semaphore value
206
Compare message semaphore value to stored semaphore
208
=
?
210
No
Exception processing
214
Yes
Process message
212
End

Fig. 2

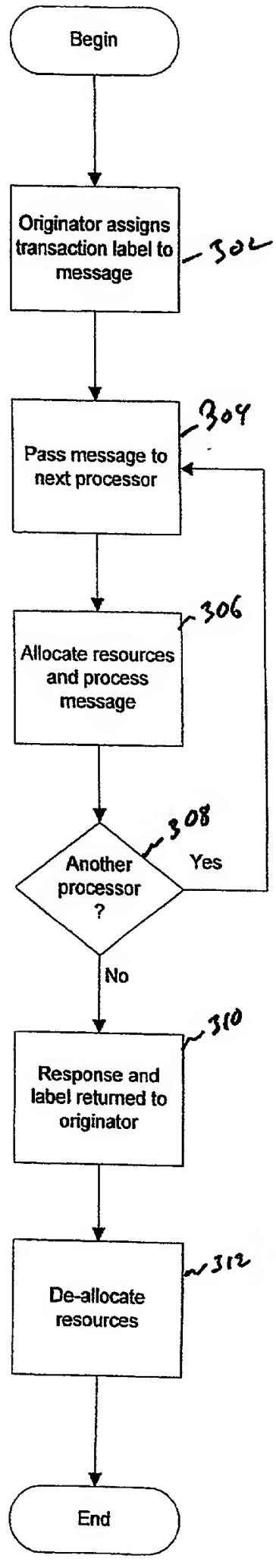

Begin
300
Originator assigns transaction label to message
302
Pass message to next processor
304
Allocate resources and process message
306
Another processor ?
308
Yes
No
Response and label returned to originator
310
De-allocate resources
312
End

Fig. 3

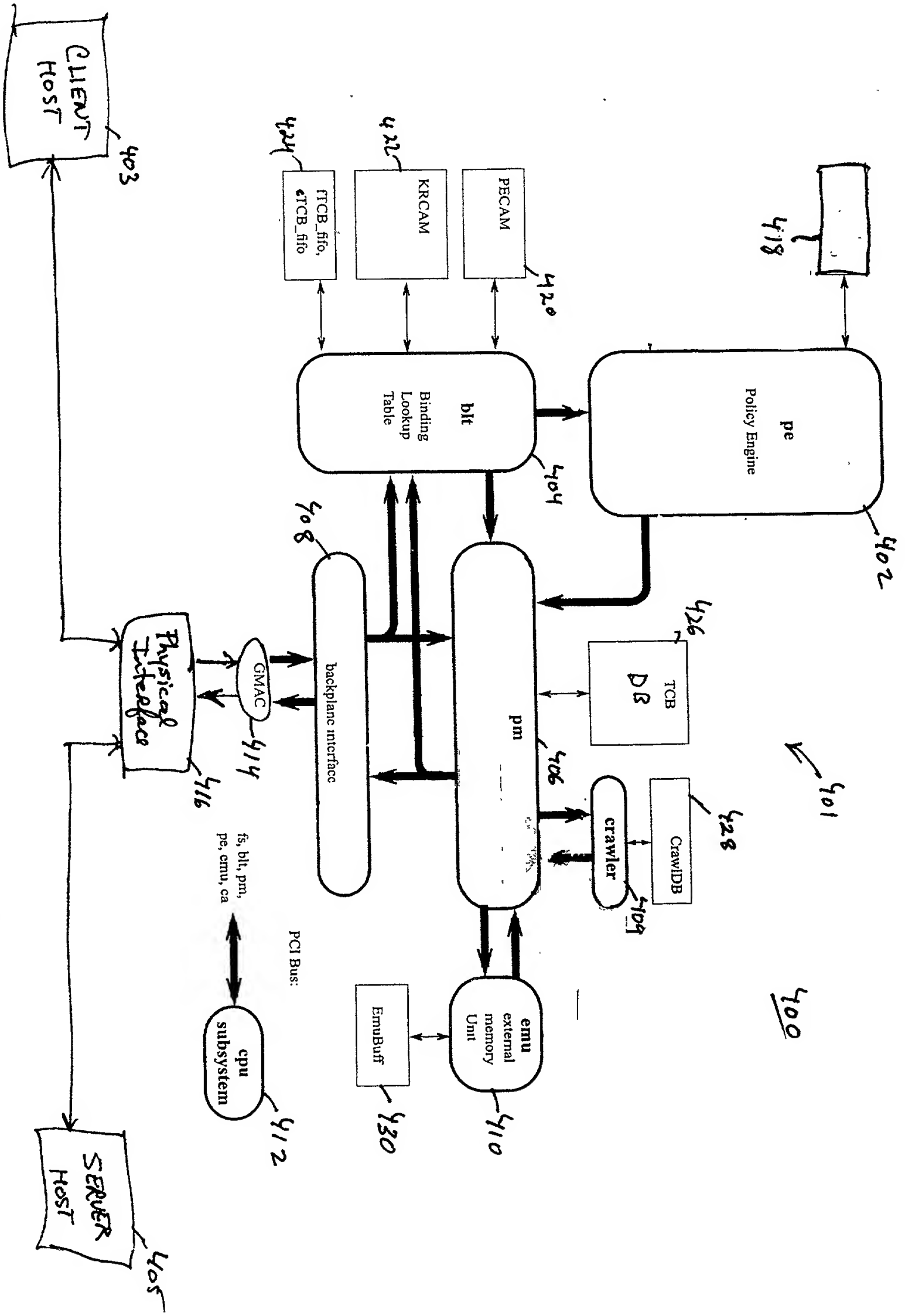

CLIENT HOST
403
fTCB_fifo, eTCB_fifo
KRCAM
PECAM
424
422
420
418
bIt
Binding Lookup Table
pe
Policy Engine
404
402
408
426
TCB DB
CrawlDB
428
pm
406
crawler
409
401
400
backplane interface
GMAC
414
Physical Interface
416
fs, blt, pm, pe, emu, ca
PCI Bus:
cpu subsystem
412
emu external memory Unit
410
EmuBuff
430
SERVER HOST
405

FIG. 4

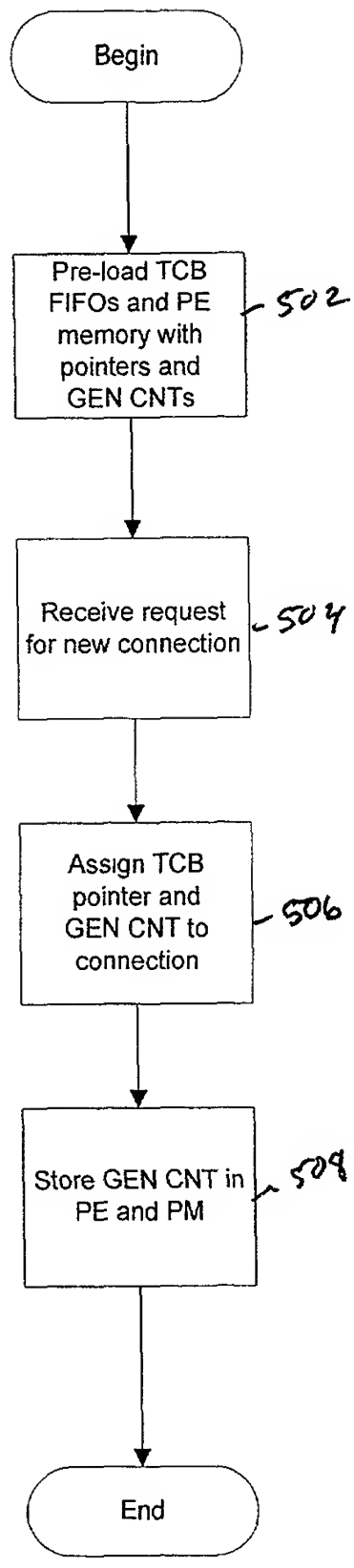

500
Begin
Pre-load TCB FIFOs and PE memory with pointers and GEN CNTs
502
Receive request for new connection
504
Assign TCB pointer and GEN CNT to connection
506
Store GEN CNT in PE and PM
509
End

Fig. 5

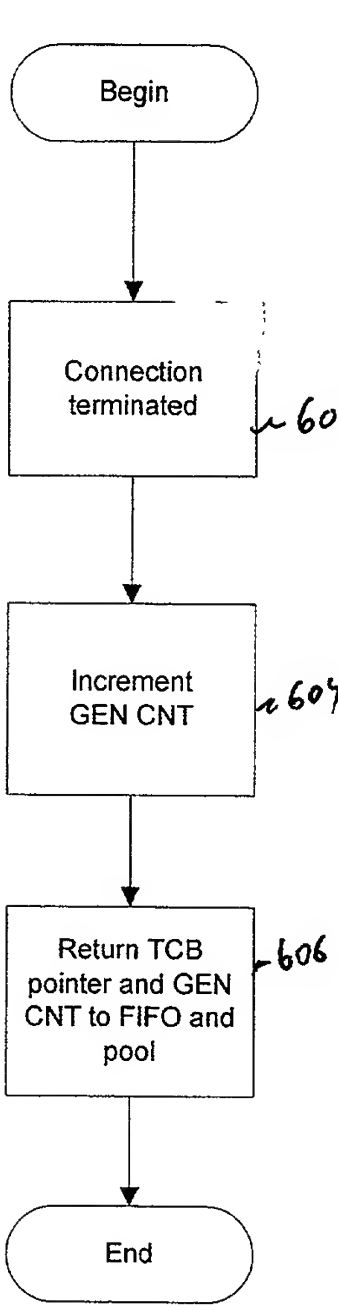
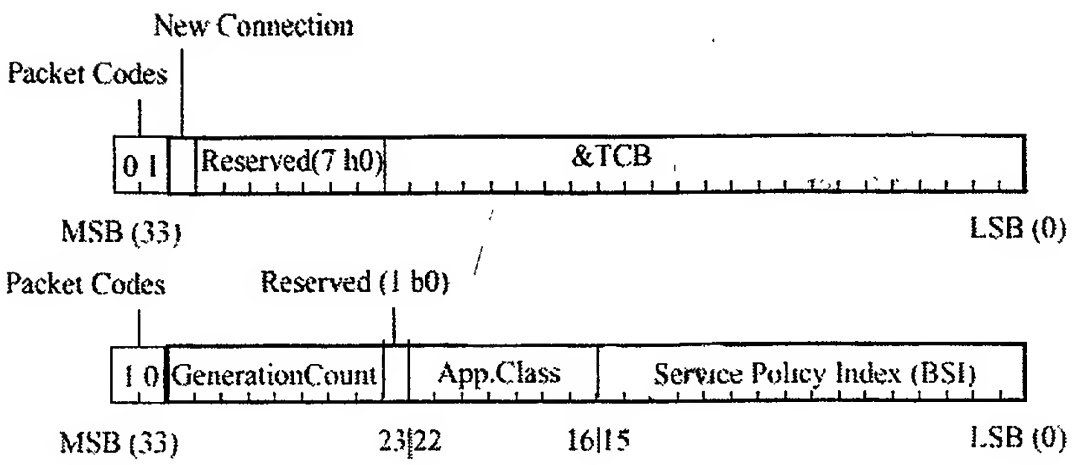

600
Begin
Connection terminated
602
Increment GEN CNT
604
Return TCB pointer and GEN CNT to FIFO and pool
606
End

Fig. 6



Element	Bits	Description
Packet Codes	2	2'b11: Invalid/Reserved (for Timestamp, format TBD). 2'b01: Start of Packet: {new, &TCB} 2'b10: End of Packet: {application class, service policy index} 2'b00: Invalid/Reserved.
New Connection	1	Logic 1 indicates a newly established connection; Logic 0 indicates a "CAM Hit" on a currently active connection.
Reserved	as needed	Logic 0; Reserved
&TCB	24	Pointer to a Flow TCB or a Client TCB or a RST/DRP/IGN pointer.
Generation Count	8	Number of times this &TCB has been recycled.
Application Class	7	Application Class field from Service Lookaside CAM.
Service Policy Index	16	Service Policy Index from Service Lookaside CAM (a.k.a. "BSI").

FIG. 7a

6-bit Packet Tags	6-bit Message Tags	64-bit Packet Data			
SOM	COM	&xTCB	Proto	Src IP Address	
SPM	NOP	tlabel | Service Policy		Reserved	Server Index
SHM	NOP	Reserved	GenCnt	History Pointer	
EOM	NOP	Dest IP Address		Src Port #	Dest Port #

Service Policy is a 22-bit quantity;
Bit number 57 in the upper SPM Reserved Field is used to indicate the client flag ;
tlabel is a 6-bit Transaction Label to be returned to Pakman upon completion of COM;
All other Data fields are aligned on 8-bit boundaries as indicated by the | marks.

Marker Packet Queue Tags Summary

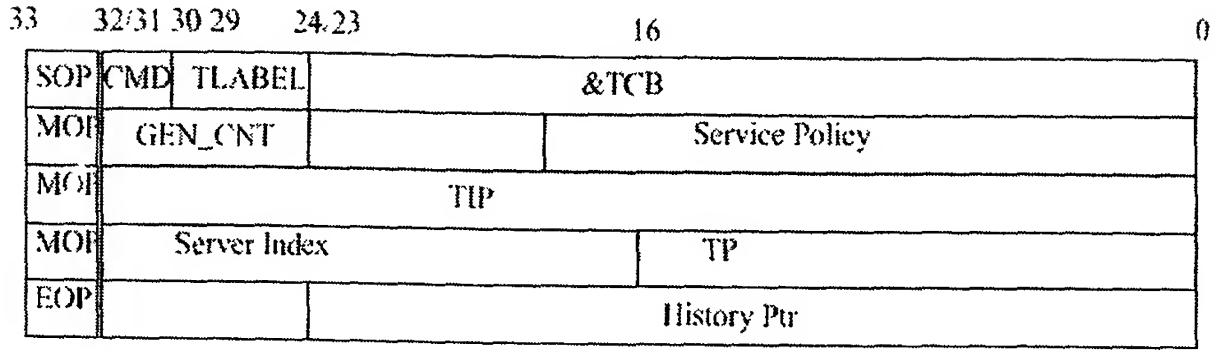
Encoding	Bits	Description
SOM	6	Start Of Marker Packet: &TCB + Protocol + Src IP Address
SPM	6	Service Policy Marker: Client Flag + 22-bit Service Policy + 16 bit Server Index.
SHM	6	Service History Marker: 32-bit Reserved Field + 32-bit History Pointer
EOM	6	End of Marker Packet: Dest IP Address + Src and Dest Ports
COM	6	Command: Options appear in table 5-2 below; usually DELete.
NOP	6	Logic 0; Reserved; Ignore Packet Data and Message Tags

Marker Packet Queue COM Options Summary

Encoding	Bits	Description
ADD	6	Associate the &xTCB with the 5-tuple Key, and return the transaction label back to Pakman.
DEL	6	Delete the association of the 5-tuple Key. (&xTCB not required) Return the transaction label back to Pakman.
PASS	6	Send Delete Datagram to PE, but do not change state of BLT CAM's.
NOP	6	Logic 0; Reserved

FIG. 7b

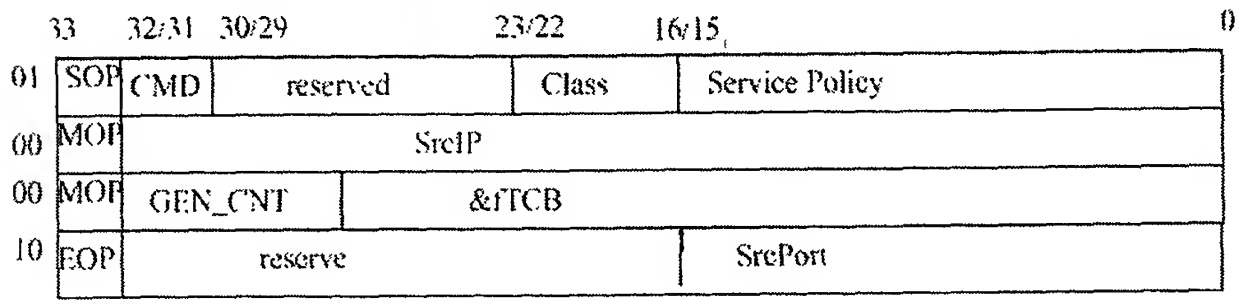
- BLT - PE Post Format for delete the connection



Posted Write Data element summary

Element	Bits	Description
CMD	2	CMD - 1 Server Delete CMD - 2 Client Delete
TLABEL	6	Labels for add or delete
Service Police	22	Service police index for mapping to Server IP Address
Server Index	16	Address pointer to locate the server table
TIP	32	Talisman's IP address
TP	16	Talisman's Port
&TCB	24	TCB Address Pointer
Time Stamp	32	TBD

BLT - PE Post Format for new service

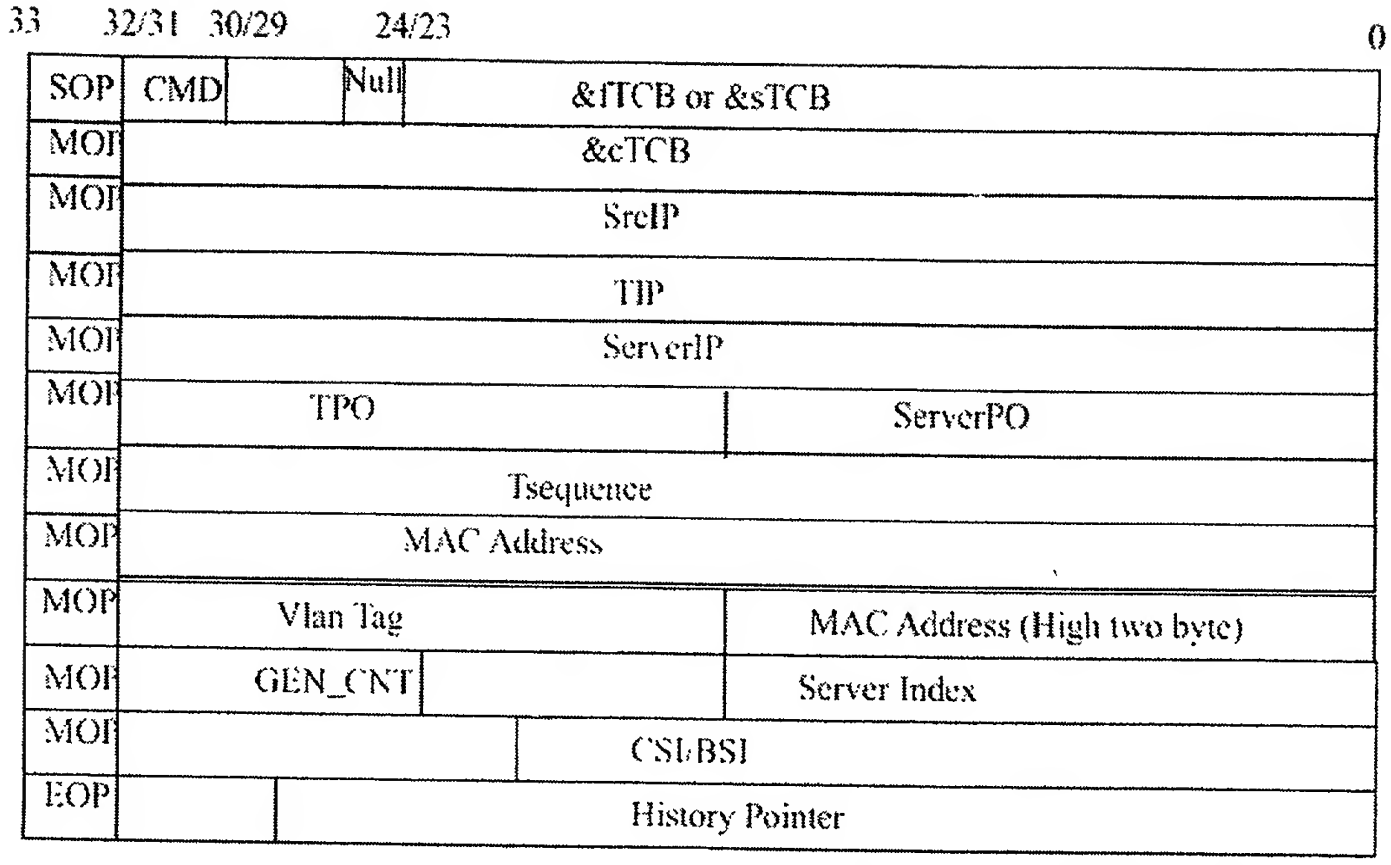


– Posted Write Data element summary

Element	Bits	Description
CMD	2	CMD - 0 &fTCB, New Service
Service Police	16	Service police index for mapping to Server IP Address
SrcIP	32	Client IP Address that request for service
&fTCB	24	Flow TCB Address Pointer
Time Stamp	32	For tracking the packet inside each block, TBD

FIG. 7c

New Packet



For Delete Packet

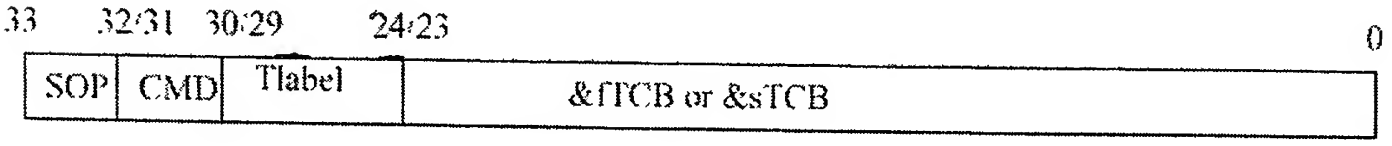
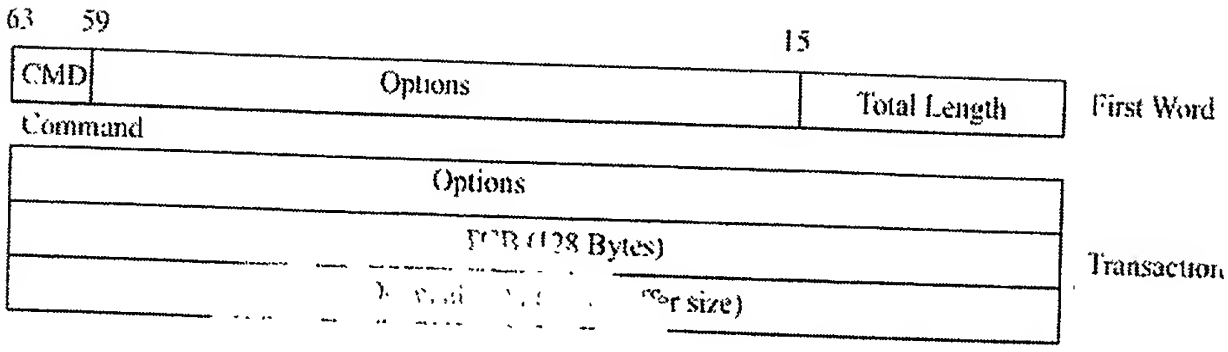


FIG. 7d

PM - EMU Post Format



PM Commands to EMU

Command Name	Command field	Required Fields
PakMan Reset	'h1	Buffer Number
PakMan LockSN	'h2	Buffer Number, Generation Count and Sequence Number
PakMan Read	'h3	Buffer Number and Generation Count
PakMan Purge	'h4	Buffer Number
PakMan Postwith DefAck	'h5	Buffer Number, Generation Count, Sequence Number, TCB and DATA
PakMan Post	'h6	Buffer Number, Generation Count, Sequence Number, TCB and DATA
PakMan Post with LockSN	'h7	Buffer Number, Generation Count, Sequence Number, TCB and DATA

FIG. 7e

63 59	35	15
4 h1	Reserved	Buffer Address (20 bits)	16 h0008

PM Reset Command

63 59	43	35	15
4 h2	Reserved	GC	Buffer Address (20 bits)	16 h0010

31	
Reserved	Full Sequence Number

PM Lock SN Commar

63 59	51	35	15
4 h4	Reserved	Purge Length	Buffer Address (20 bits)	16 h0008

PM Purge Command

63 59	43	35	15
4 h3	Reserved	GC	Buffer Address (20 bits)	16 h0008

PM Read Command

63 59	35	15
4 h6	Sequence Number [23:0]	Buffer Address (20 bits)	16 h0088 + DATA

39 31	
Reserved	GC	Full Sequence Number
TCB (128 Bytes)	
DATA (up to buffer size)	

PM Post Commana

63 59	35	15
4 h5	Sequence Number [23:0]	Buffer Address (20 bits)	16 h0088 + DATA

39 31		
Reserved	GC	Full Sequence Number
TCB (128 Bytes)		
DATA (up to buffer size)		

PM Post with Deferred Ack Command

63 59	35	15
4 h7	Sequence Number [23:0]	Buffer Address (20 bits)	16 h0088 + DATA

39 31		
Reserved	GC	Full Sequence Number
TCB (128 Bytes)		
DATA (up to buffer size)		

FIG. 7F

PM Post with Lock SN Command

Method and System for Maintaining
Temporal Consistency of Resources and Data in a
Multiple-Processor Packet Switch
02453.0005.NPUS00 Inventor: Puri, et al.
Michael K. Lindsey, Howrey Simon
Arnold & White 312 595-1239

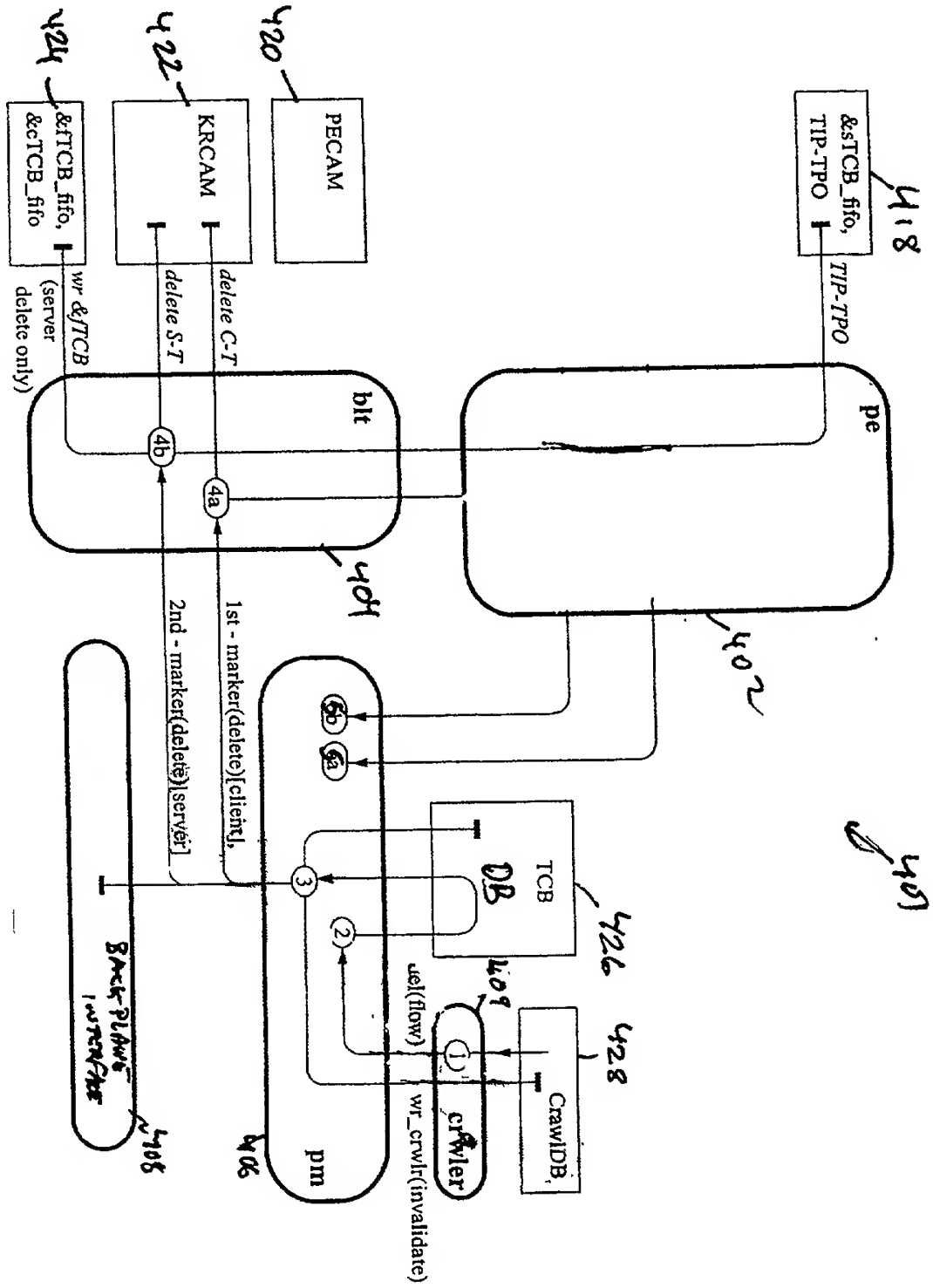


FIG. 8

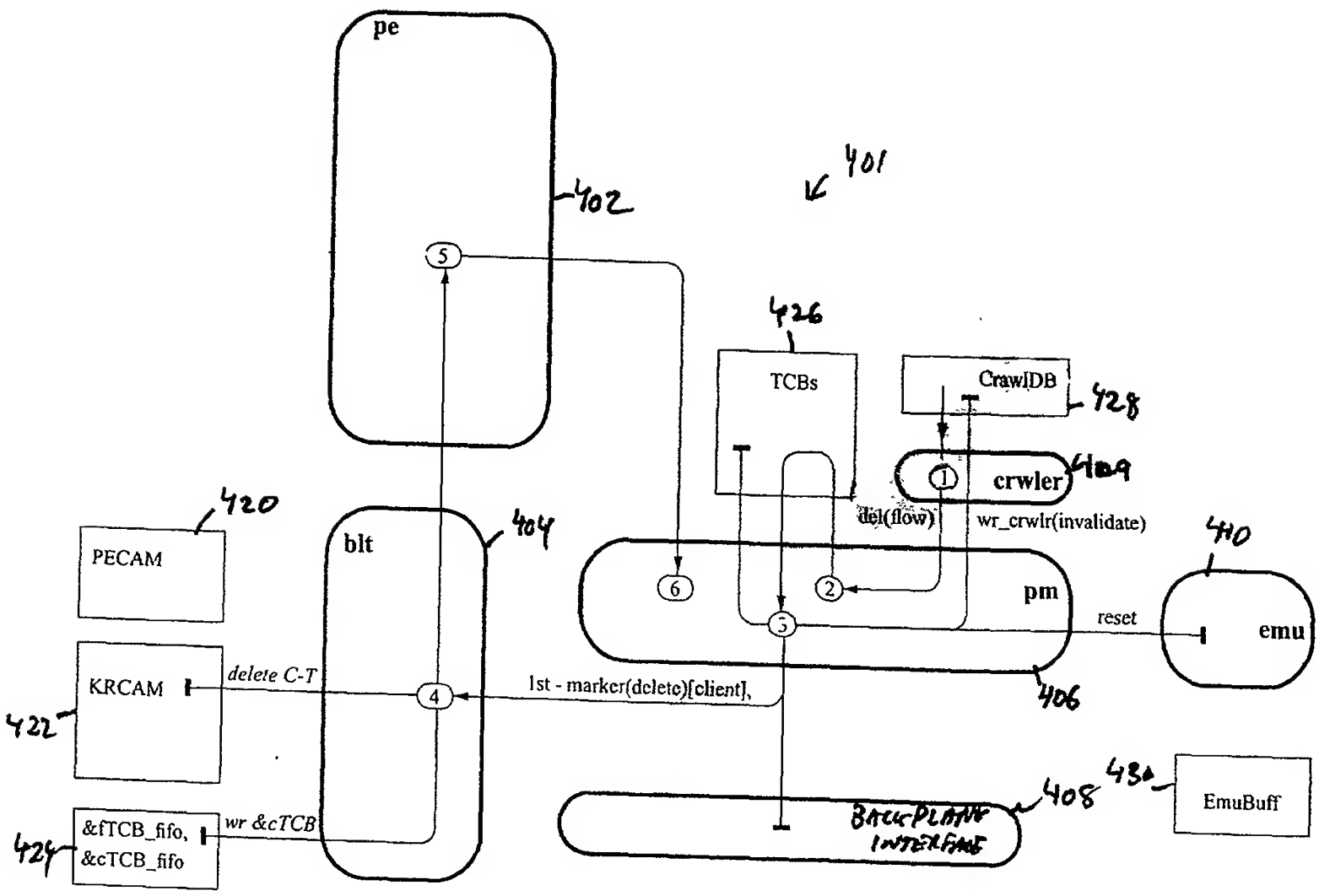

pe
401
402
5
426
TCBs
CrawlDB
428
1
crwler
409
del(flow)
wr_crwlr(invalidate)
410
420
PECAM
blt
404
6
2
pm
reset
emu
3
KRCAM
delete C-T
4
1st - marker(delete)[client],
422
406
&fTCB_fifo,
&cTCB_fifo
wr &cTCB
424
408
BACKPLANE INTERFACE
430
EmuBuff

FIG. 9

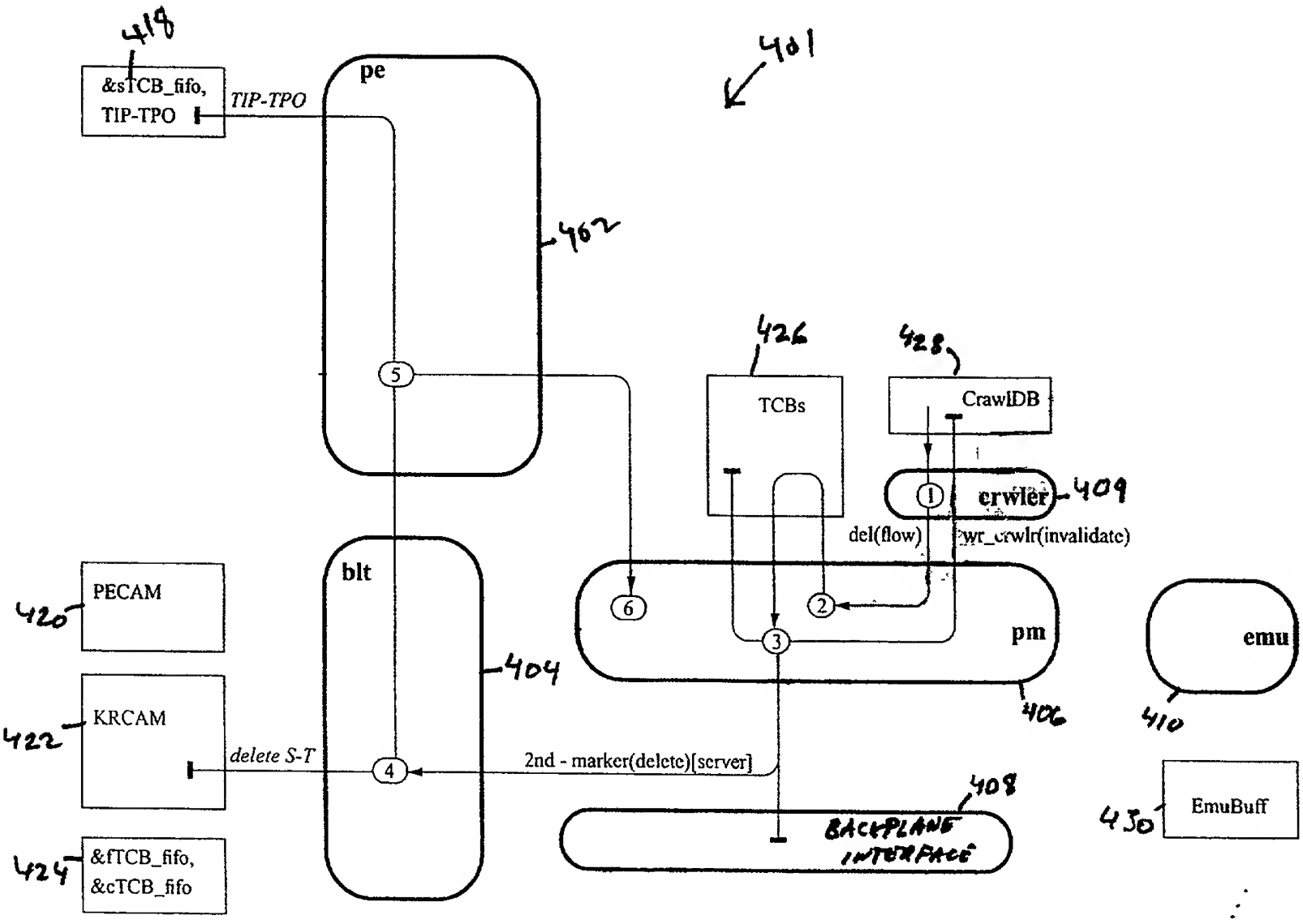

418
&sTCB_fifo,
TIP-TPO
TIP-TPO
pe
401
402
426
TCBs
428
CrawlDB
1
crwler
409
del(flow)
wr_crwlr(invalidate)
PECAM
420
blt
404
6
2
3
pm
emu
406
410
KRCAM
422
delete S-T
4
2nd - marker(delete)[server]
408
BACKPLANE
INTERFACE
EmuBuff
430
&fTCB_fifo,
&cTCB_fifo
424

FIG. 8D